Going Paperless: Can It Be Done?

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Background. Since 1989, Beth Israel Hospital has been deploying an extensive online patient record (the OMR), which augmented a heavily used integrated hospital information system. Initially begun in a large primary care practice, the system is now used to share patient records among over 30 practices on three campuses. Although the system was intended to eliminate the need for paper, we found that it has, in the short term, increased the amount of paper produced. We wanted to explore the factors that contribute to this "paper paradox" and discuss the costs associated with increased paper production, areas in which we have reduced paper handling, and strategies for reducing our reliance on paper.

Methods. Although the data in the OMR is accessible to all authorized users of the hospital information system, we define OMR use as actually entering data into it. To monitor the use of the OMR we wrote programs which examined use of the system as compared with all patients scheduled to be seen in our hospital-based clinics and health centers. All clinics regardless of their use of the OMR utilized the online scheduling system. The raw data was then transmitted via FTP protocol to a networked Windows NT file server for analysis using PC-based software.

We estimated institutional costs based upon on 1996 costs of supplies and wages for medical records workers in our institution.

Results. Growth, as measured by amount of new documentation into OMR per unit time, has grown exponentially since its inception. The greatest numbers of new practices began using OMR in the period from 1995-96. By the end of 1996 1001 providers in 36 practices had entered OMR information into the records of 67,604 different patients.

Three of these practices, including the pilot site, were primary care practices. The 2 off-site primary care practices were part of multidisciplinary health centers that were geographically distant from the medical center. The directors of one of the centers decided soon after it opened to adopt the OMR as their standard of care.

In 1996, there were 19 practices on the main campus that documented over 50% of their patient visits in the OMR. Overall, these 19 clinics accounted for 39 percent of visits to the medical center. There was no relation between intensity of use of the OMR and the number of years they had been using it.

Also in that year, 653 providers (of which 76 percent were physicians) entered new data into the records of 30,508 different patients. Compared with 1995, the number of providers had increased 16 percent and the number of patients increased 34 percent.

Cost Savings and Potential. Although it is difficult to estimate the cost to patient care of a paper record that is not delivered in a timely manner (in some institutions, this proportion is 30%), is not legible, or is incomplete (more than 40%), some savings are more concrete.

The cost is about $1 per paper record request in the main campus of our institution. This includes retrieving, tracking, delivering, retrieving, and refiling the record. By 1996 we have been able to stop routine delivery of 20,000 records to primary care for phone messages and 36,000 records to the emergency unit, for a total savings of $56,000.

If we stopped delivering paper medical records to the 19 practices that have at least 50% of their notes online we would save an additional $109,000 per year. (If we were able to stop delivery of paper to all clinics, this figure would approximately double.)

Our medical records department prints more than 367,000 sheets of paper each year for filing in records of ambulatory patients. That is roughly 1000 sheets per day. 71% of this is printouts of patient results reports for filing, 20% is OMR notes, and 9% is operative notes and discharge summaries. The cost for supplies to print this (and thus the potential cost savings) is $20,000.

Filing these papers requires about 6000 hours, which is worth $69,000. These documents occupy 187 linear feet of file space. The space that these records consume (the opportunity cost of this space) is worth $10,000.

The total potential savings is therefore $200,000 per year.

Overall, the total of realized and potential cost savings from not having to manage paper records in our institution is $250,000 per year.

Discussion. Despite our hopes, the computerization of medical records has not led to paperless medical care. Worse than that, it has increased the amount of paper produced which must be managed by our organization. The reasons for the "Paper Paradox" include comfort and convenience with paper, legal issues, and difficulty with organizational transitions to online records.

Conclusion. In our medical center we have been successful in deploying a computerized patient record and saving $56,000 per year, and we are developing a timeline to stop the printing and unnecessary delivery of paper records to save an additional $200,000 per year.